TM-03817A-12/1 *(Non registered)*

OPERATOR'S MANUAL
for

RADIO SET AN/PRC-47 AND ACCESSORIES

UNITED STATES MARINE CORPS

Approved by U.S. Marine Corps:

27 June 1962
Change 1: 12 July 1963

LIST OF EFFECTIVE PAGES

PAGE NUMBERS	CHANGE IN EFFECT	PAGE NUMBERS	CHANGE IN EFFECT
Title Page	Change 1	1-4 to 1-7	Change 1
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1-1 to 1-2	Change 1	3-7 to 3-8	Original
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PAGE NUMBER	CHANGE IN EFFECT
1-9	Change 1
1-10	Change 1
3-8	Change 1

DEPARTMENT OF THE NAVY
Headquarters U. S. Marine Corps
Washington 25, D. C.

27 June 1962

1. This publication, TM-03817A-12/1, is effective upon receipt and includes current information as of 20 June 1962.

2. This Manual is published for the information and guidance of all concerned with Radio Set AN/PRC-47.

3. Notice of any discrepancies and suggested changes to this publication should be directed to the Commandant of the Marine Corps (Code CSY).

By direction of the Commandant of the Marine Corps

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RECORD OF CORRECTIONS MADE

CHANGE NO.	DATE	FIELD CHANGE NO.	SIGNATURE

U. S. MARINE CORPS TECHNICAL MANUAL

TM-03817A-12/1

RADIO SET AN/PRC-47

CHANGE 1

Department of the Navy
Headquarters, U. S. Marine Corps
Washington 25, D. C.

12 July 1963

1. This Change is effective upon receipt. It is for the information and guidance of all concerned with the operation and organizational maintenance of the Radio Set AN/PRC-47

2. Notice of discrepancies and suggested changes in this publication should be directed to the Commandant of the Marine Corps (Code CSY).

By direction of the Commandant of the Marine Corps

W. P. BATTELL
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Quartermaster General of the Marine Corps

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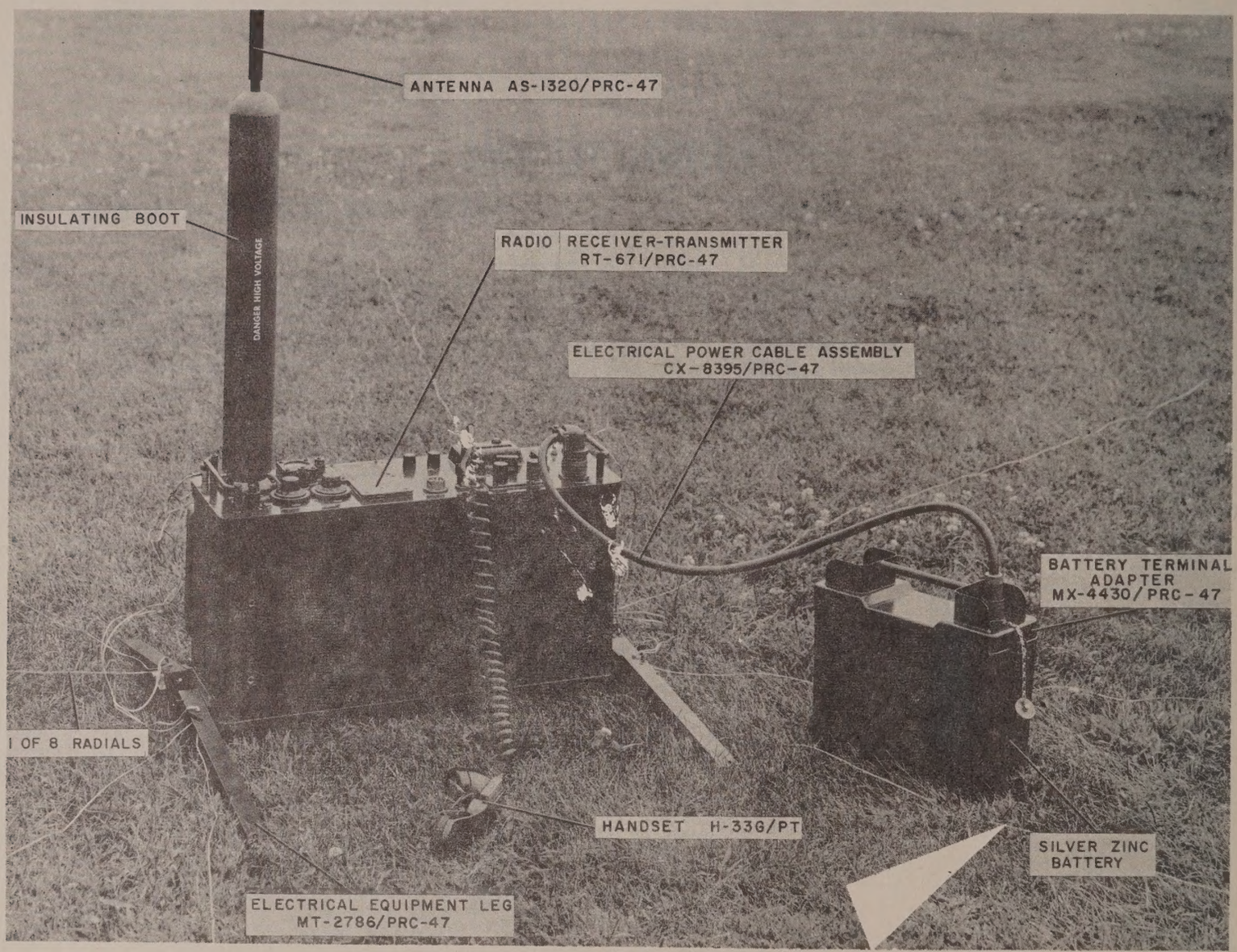


Figure 1-1. Radio Set AN/PRC-47 Operating Setup

SECTION 1
GENERAL INFORMATION

1-1. GENERAL.

This technical manual contains equipment description, instructions for preparation for use and stowage, and operating instructions for Radio Set AN/PRC-47. Major components of the equipment are identified in figure 1-1.

1-2. FUNCTIONAL DESCRIPTION.

a. PURPOSE OF EQUIPMENT. - Radio Set AN/PRC-47 (hereinafter referred to as the radio set) is a complete portable high-frequency communications system including antenna and accessories. The radio set provides continuous wave (CW) and upper sideband (USB) voice transmission and reception in 1-kilocycle increments over the frequency range of 2 to 11.999 megacycles. The equipment is also capable of frequency shift keying (FSK) communication when operated in conjunction with a frequency shift keying converter. The radio set may be operated at its own control panel or from a remote control panel.

b. EQUIPMENT APPLICATIONS. - The radio set may be used in portable, vehicle, and fixed station applications. In the portable application, the complete equipment can be packed by two men. For this application, the radio set is powered by a 24-volt battery which is part of the equipment. For mobile application, the equipment is mounted in a suitable vehicle (for example; truck, 1/4-ton 4 x 4 M38A1) and is powered by the vehicle's 26.5-volt d-c generator. For fixed station application, the equipment may be powered by a 115-volt, single-phase, 400-cps power supply. Figure 1-1 shows a field setup of Radio Set AN/PRC-47, and figure 1-2 shows placement of radial wires.

For high-power voice or CW operation (extended time) the radio set duty cycle is 1 minute (maximum) of transmission for every 9 minutes (minimum) of reception. For low-power extended time operation, the duty cycle for voice or CW operation is 2 minutes transmit for 9 minutes receive time.

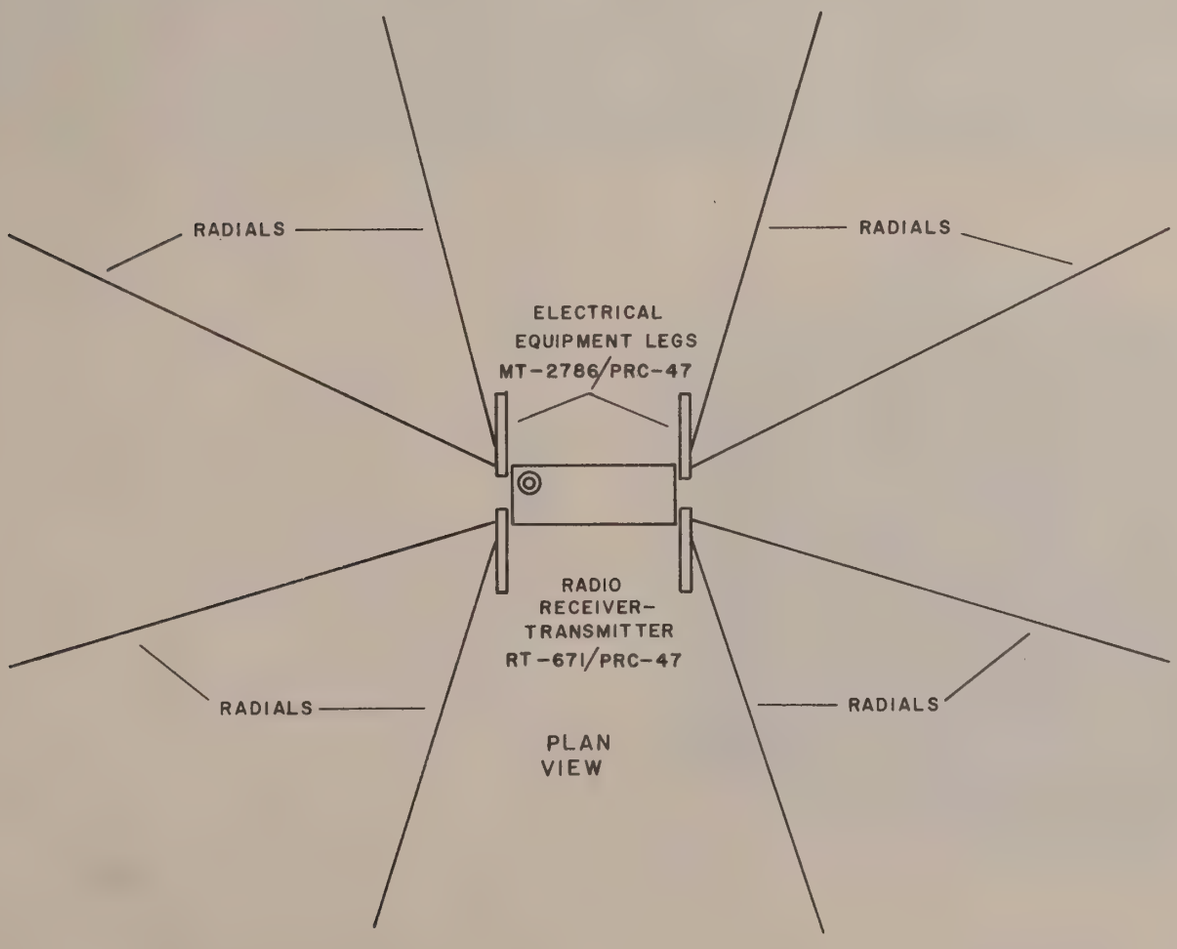


Figure 1-2. Radio Set AN/PRC-47 Field Setup, Plan View, Radial Placement

Figure 1-3. Rucksack Frames Packed with Radio Set AN/PRC-47

Limited low-power cycle is 10 minutes transmit for 5 minutes receive operation not to exceed 1 hour total. For normal voice communication, with 1 minute transmission and 9 minutes reception, one battery charge will last approximately 12 operating hours.

Figure 1-4. Radio Set Case CY-3700/PRC-47

1-3. DESCRIPTION OF EQUIPMENT.

a. RADIO SET. - The radio set consists of seven major units and a number of accessories which are required for operation. The seven major units are a receiver-transmitter; three silver-zinc batteries; separate power cables for a-c, battery, and d-c operation; a whip antenna; and a radio set case. The accessories are listed in table 1-3.

The radio set is divided into two parts for portage. Each part is man packed on a separate rucksack frame (see figure 1-3). One part consists of the receiver-transmitter. The other part consists of the silver-zinc battery, the associated power cable, the whip antenna, and accessory equipment required for portable operation.

When it is desired to store the equipment or transport it by vehicle, the equipment is placed in the radio set case. This case is waterproof and holds the complete equipment (see figure 1-4). Three identical silver-zinc batteries are included in the radio set case. Separate compartments are provided in the radio set case for the various components and accessories of the radio set.

b. RECEIVER-TRANSMITTER. - The receiver-transmitter contains the major electronic circuits and controls of the radio set. The receiver-transmitter is normally housed in its own case (see figure 1-3). When the cover of this case is closed, it is completely watertight. The case is mounted on the rucksack frame as shown in figures 1-3 and 2-2.

In normal operation, the cover of the receiver-transmitter case is removed to reveal the control panel of the receiver-transmitter and is secured to

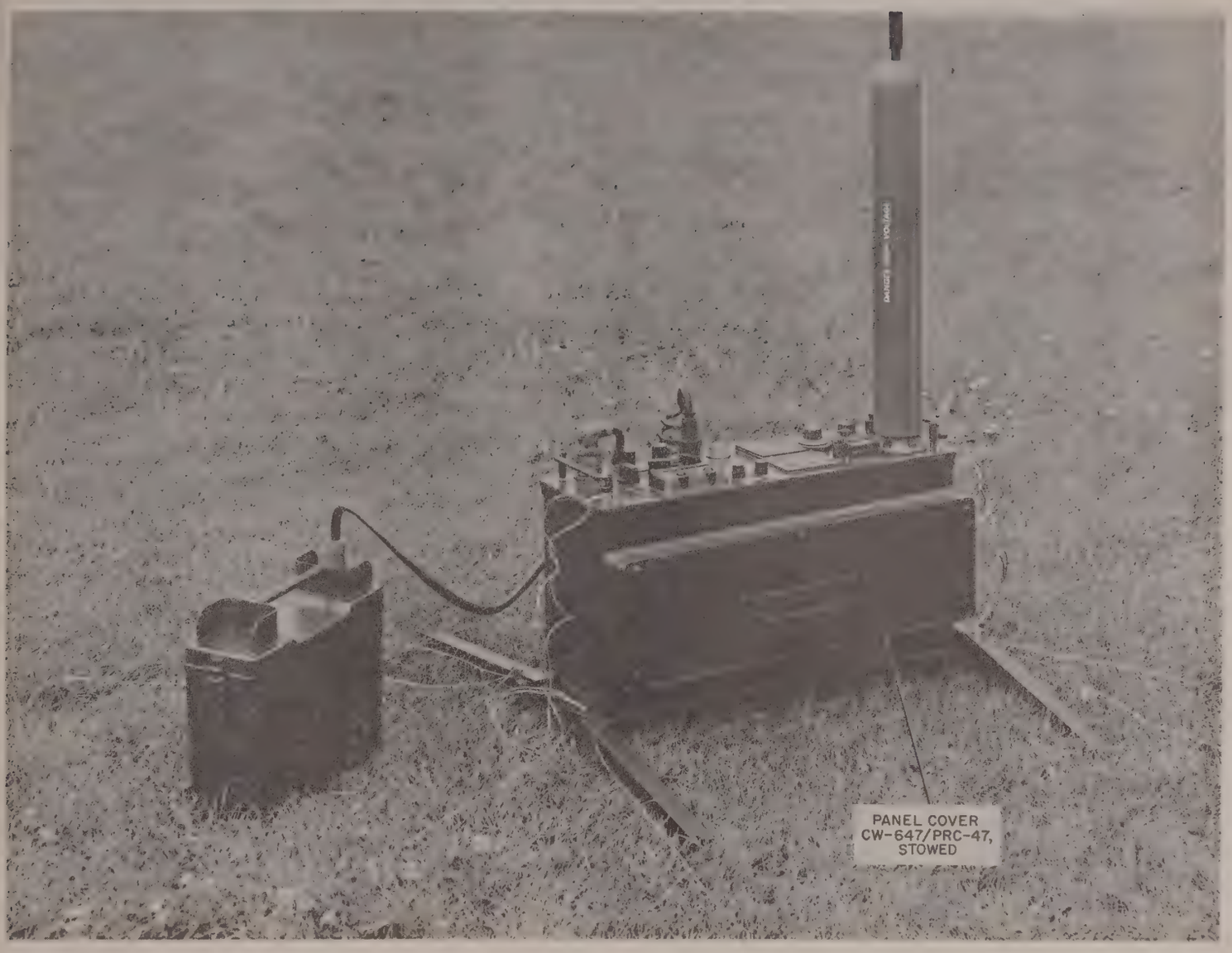


Figure 1-5. Operating Setup, Showing Panel Cover CW-647/PRC-47 Stowed

the side of the receiver-transmitter case. Refer to figure 1-5. All controls and connections necessary for operation and tuning of the receiver-transmitter are located on the control panel.

Removal of the receiver-transmitter case provides access to six plug-in modules which contain the major electronic circuits of the radio set. A gear train that provides a mechanical connection from the control panel to the modules is provided at the back of the control panel. Figure 1-6 shows the location of the modules. Test points are located on top of the modules for adjustment, alignment, and trouble shooting.

c. SILVER-ZINC BATTERY.

(1) GENERAL. - The silver-zinc battery is a 24-volt (nominal), 25-ampere hour (nominal) rechargeable storage battery which is used in portable application of Radio Set AN/PRC-47 where no other suitable power source is available. The battery is nomenclatured Battery, Storage BB-451/U. Three batteries are supplied with each radio set. The same battery is used with Radio Sets AN/PRC-41 and AN/PRC-38. Battery Terminal Adapter MX-4430/PRC-47 is provided as a carrying handle and as a plug terminal adapter for cable connection. The battery is watertight when connected to the radio set with Cable Assembly CX-8395/PRC-47. To avoid a long formation and activation period, the BB-451/U is supplied in a dry charged condition.

(2) CONSTRUCTION.- The battery is contained in a watertight fiberglass case with a stainless steel cover plate. After removing the cover plate, the cells may be removed in groups of four using only ordinary hand tools. A plastic sheet for recording charging history is bonded to the under side of the cover plate.

(3) CELLS. - The battery consists of 16 series connected silver-zinc cells constructed in blocks of

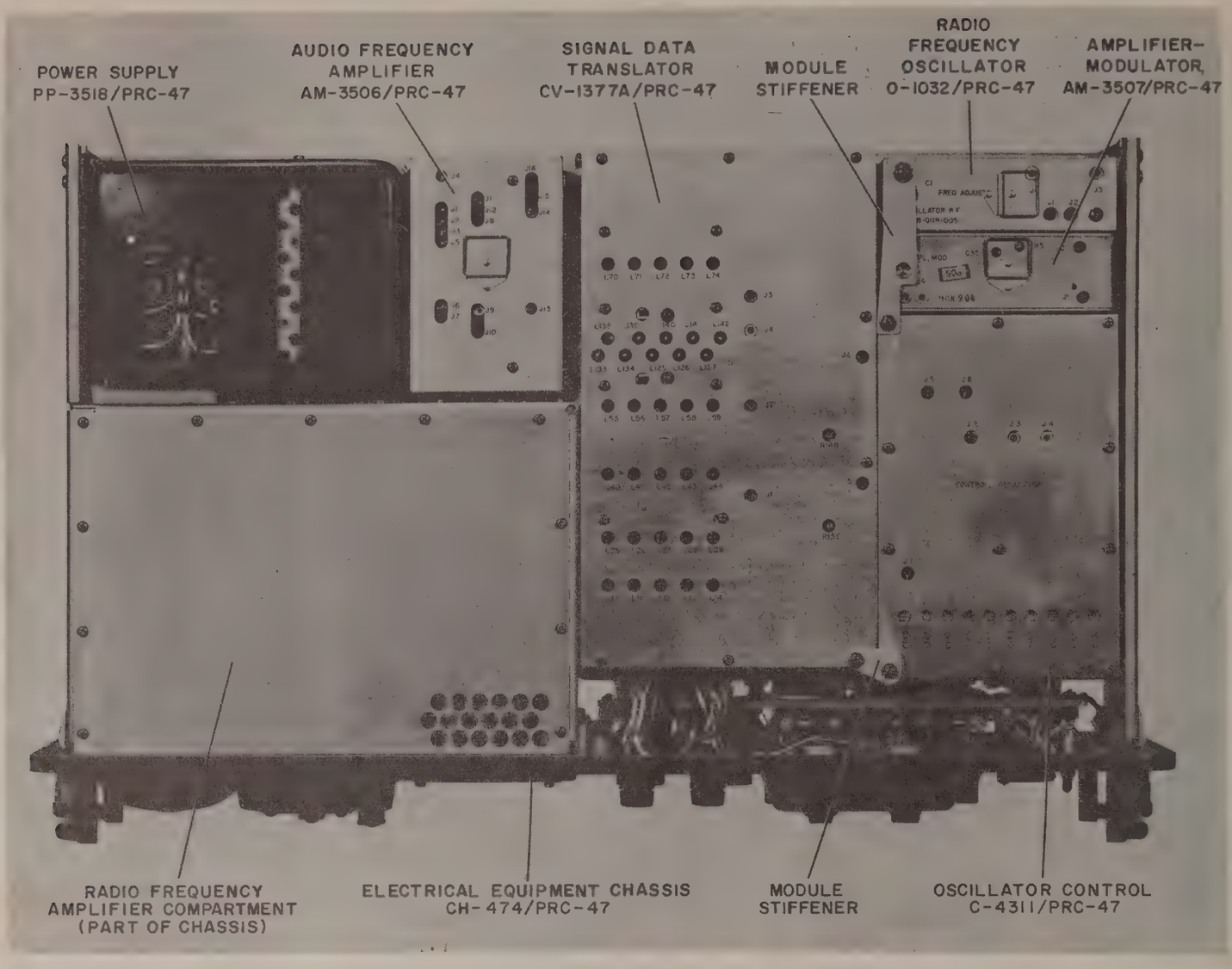


Figure 1-6. Radio Receiver-Transmitter RT-671/PRC-47 Case Removed

four cells each. Nominal open circuit voltage of a fully charged cell is 1.86 volts per cell. The minimum voltage per cell under specified load is 1.375 volts at -11°C (+12°F), and above, and 1.250 volts from -10° to -25°C (+14° to -13°F). All cells will provide the minimum performance shown in table 1-1.

(4) CHARGE RETENTION (DRY). - Charge retention of a dry, charged cell over the specified periods will be in accordance with the minimum values indicated below:

(a) 2 years at +30°C (+86°F) and below - 98% (19.6 ampere-hours).

(b) 1 year at +50°C (+122°F) and below - 80% (16 ampere-hours).

(c) 3 months at +65°C (+149°F) and below - 50% (10 ampere-hours).

(5) ACTIVATION. - The cells of the silver-zinc battery will deliver the specified ampere-hour capacity after a 24-hour "soak" in the electrolyte, a 40-percent solution of potassium hydroxide and other additives furnished by the manufacturer. A booster charge is permissible if the temperature and storage limits of paragraph (4) above have been exceeded.

WARNING

The basic potassium hydroxide electrolyte in the battery is corrosive to aluminum and other metals. DO NOT add acid to this battery. If acid is added to the electrolyte, a violent reaction will occur. This reaction will be dangerous to personnel and will also damage the battery.

(6) CHARGE ACCEPTANCE. - The battery cells will perform according to specifications after charging at a modified constant current of 2.5 amperes average with voltage cutoff at 2.03 volts. Emergency charging

TABLE 1-1. BATTERY CELL PERFORMANCE (WET)

TEMPERATURE		CAPACITY (amp-hr)	RECHARGE CYCLES	WET LIFE (months)	CHARGE RETENTION (percentage)
(deg C)	(deg F)				
-25	-13	15	15	6	80% for 6 months
-18	0	20	20	6	80% for 6 months
0	+32	20	25	12	80% for 6 months
+5	+41	20	50	18	80% for 6 months
+30	+86	20	50	18	80% for 6 months
+38	+100	20	25	12	70% for 3 months
+50	+122	20	15	2	50% for 1 month
+60	+140	20	10	1	50% for 2 days

of the cells is possible by charging at a constant potential of 2.03 volts per cell with charge acceptance as follows: a 0.5-hour charge period replaces 50 percent of the capacity removed on previous discharge; a four-hour charge period replaces 60 percent of the capacity removed on the previous discharge. All recharging must be with Battery Charger PP-3240/U or its exact replacement. Curves for battery charging are shown in figure 2-1.

(7) STORAGE. - Dry, charged cells are filled with an inert gas by the manufacturer and may be stored under the following conditions:

temperature range	-65°C to +65°C (-85°F to +149°F)
relative humidity	100 percent
attitude	any
altitude	40,000 ft.

Wet, charged cells should be stored in an upright position and will perform as per table 1-1.

d. POWER CABLES. - Three separate power cables are provided with the equipment for the three applications described in paragraph 1-2*a* (see paragraph 1-7). Electrical Power Cable Assembly CX-8395/PRC-47 is used in the portable application to connect the battery power supply to Radio Receiver-Transmitter RT-671/PRC-47. Electrical Power Cable Assembly CX-8394/PRC-47 is used in the mobile application to connect a 26.5-volt d-c system to RT-671/PRC-47. Electrical Power Cable Assembly CX-8393/PRC-47 is used in the fixed site application to connect a 115-volt, single-phase, 400-cps source to RT-671/PRC-47.

e. ANTENNAS. - The radio set includes Antenna AS-1320/PRC-47 (a 15-foot whip) and Antenna AS-1321/PRC-47 (a long-wire antenna) either of which may be connected to the receiver-transmitter. Both antennas connect directly to the control panel of the RT-671/PRC-47.

Antenna AS-1320/PRC-47 consists of nine sections which can be assembled quickly by hand (see figure 1-7). Antenna AS-1321/PRC-47 (see figure 1-7) is a 45-foot antenna with insulators at 15 feet and 25 feet. Jumpers with alligator clips are permanently attached near the insulators so that the correct antenna length for the operating frequency may be chosen by shorting out the insulators as required.

For the mobile application, the radio set is used with a vehicular whip antenna. For the fixed site application, any suitable antenna may be used. In the mobile and fixed site application, the antenna terminal adapter is taken off the long-wire antenna and used with the antenna lead wire to connect the antenna to the receiver-transmitter control panel.

f. ELECTRICAL EQUIPMENT LEGS MT-2786/PRC-47. - Electrical Equipment Legs MT-2786/PRC-47 (see figure 1-1) are included with the radio set to support the receiver-transmitter or to prevent tipping when Antenna AS-1320/PRC-47 is used in high winds. The electrical equipment legs attach to each end of the receiver-transmitter, as shown in figure 1-1, and are adjustable to compensate for uneven ground conditions.

g. ANTENNA GROUND PLANE. - The antenna ground plane for the portable application consists of eight wires permanently attached to Electrical Equipment Legs MT-2786/PRC-47. When radio set is set

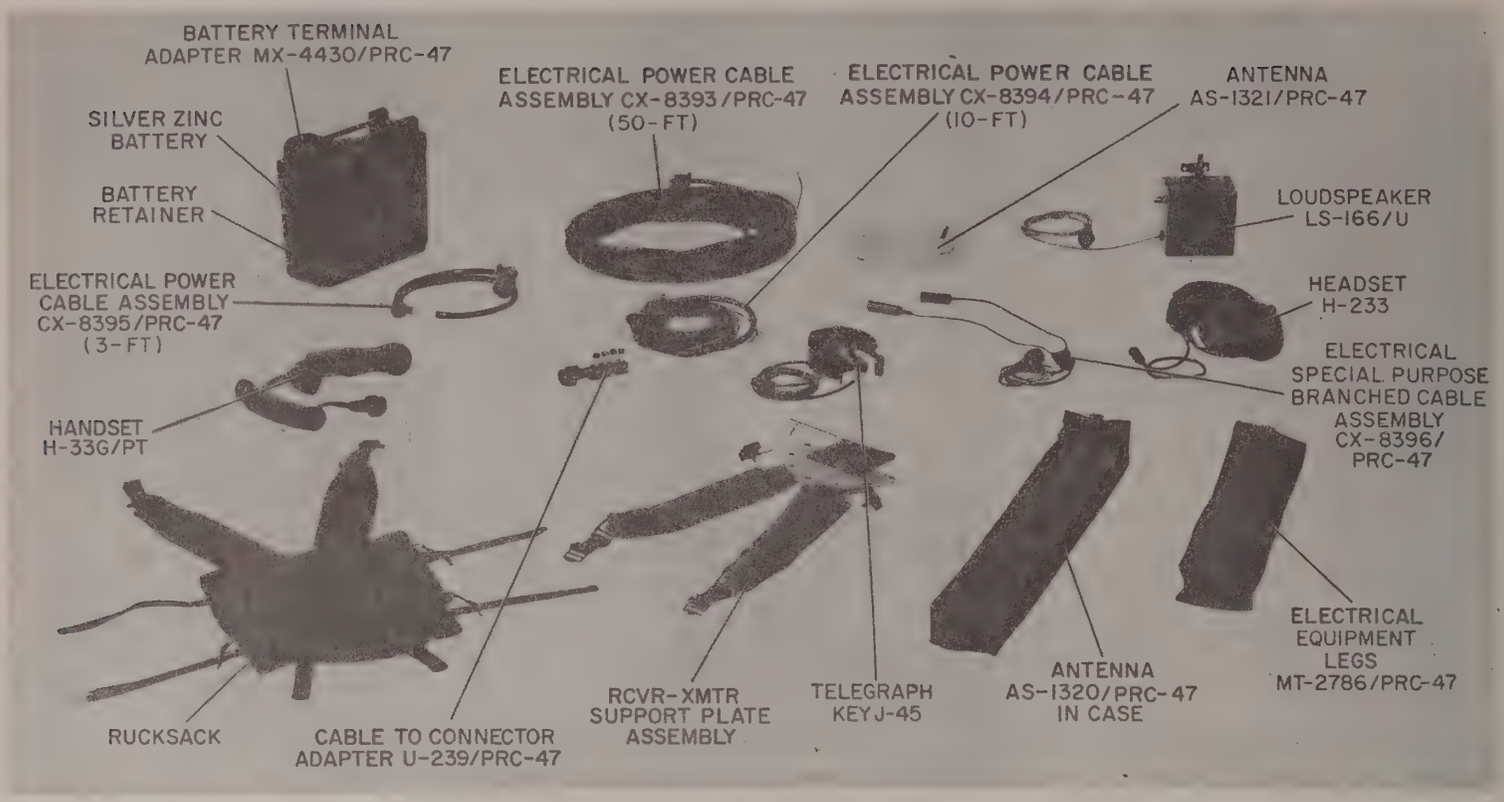


Figure 1-7. Radio Set AN/PRC-47, Accessories

up for transmission, the eight ground plane wires are unwound and spread out in a radial pattern. Also, a short wire with a pin terminal is connected to the ground plane wires wound on each MT-2786/PRC-47. Each pin is inserted into a spring-loaded grounding terminal at each end of the control panel, connecting all ground plane radials to the panel. Refer to figure 1-2 for positioning of ground plane radials.

h. AUDIO ACCESSORIES. - Voice operation of the radio set is accomplished with Handset H-33G/PT. This handset is connected directly to the control panel of the receiver-transmitter (see figure 1-7). Two audio receptacles are provided on the control panel so that two handsets may be connected.

For CW operation, Headset H-233 and Telegraph Key J-45 are used (see figure 1-7). They are connected through Electrical Special Purpose Branched Cable Assembly CX-8396/PRC-47 to one of the audio receptacles on the control panel.

The radio set may be operated remotely by Control Group AN/GRA-6 which is connected to one of the audio receptacles on the front panel of RT-671/PRC-47. Control Group AN/GRA-6 provides on-off and push-to-talk functions and audio connections. The control group is not part of the radio set.

For frequency shift keying operation (FSK), Cable to Connector Adapter U-239/PRC-47, which is supplied as part of the radio set, is connected to one of the audio receptacles on the control panel of the receiver-transmitter. Also, an FSK converter, such as CV-786/TRC-75, must be used. During FSK operation the specified duty cycle must not be exceeded.

Loudspeaker operation of the radio set is possible with Loudspeaker LS-166/U. It is connected to one of the audio receptacles on the receiver-transmitter control panel.

i. RUCKSACK. - One rucksack and two canvas cases are provided for portage. The rucksack is provided to pack Electrical Power Cable Assembly CX-8395/PRC-47 and the various accessories required for portable operation: Antenna AS-1321/PRC-47, Handset H-33G/PT, Headset H-233, Telegraph Key J-45, and Electrical Special Purpose Branched Cable Assembly CX-8396/PRC-47. One canvas case is used to pack Electrical Equipment Legs MT-2786/PRC-47, and the other canvas case is used to pack Antenna AS-1320/PRC-47. The rucksack, the canvas cases, and Storage Battery BB-451/U are packed on one rucksack frame. The receiver-transmitter is packed on the other rucksack frame.

j. ACCESSORIES CASE CY-3657/PRC-47. - Accessories Case CY-3657/PRC-47, shown in figure 1-8, is a special carrying case for transport and storage of spare modules for Radio Set AN/PRC-47. The accessories case is provided with shaped lining and necessary trays to provide protection for the modules against transport and storage damage. Allowances for this item are included in appropriate Maintenance Float directives.

Figure 1-8. Accessories Case CY-3657/PRC-47

1-4. QUICK REFERENCE DATA.

Quick reference data for the radio set is provided in table 1-2.

TABLE 1-2. QUICK REFERENCE DATA (Sheet 1 of 2)

CONDITIONS	SPECIFICATIONS
Ambient Temperature Range	-40°C (-40°F) to +60°C (+140°F).
Ambient Humidity Range	0 to 100 percent relative.
Altitude Range	Sea level to 12,000 feet.
Power Source	With d-c power supplies: 24-volt d-c silver-zinc battery; 26.5-volt d-c vehicular supply.
	With a-c power supplies: 115 volts, single phase, 400 cps.
Power Consumption	Transmit: not more than 320 watts. (Normal voltage, average power, voice operation).
	Receive: not more than 21 watts (at maximum battery voltage and with lights on).
Duty Cycle	High Power: 1 minute transmit 9 minutes receive for 1 hour
	Low Power: 2 minutes transmit 9 minutes receive or 10 minutes transmit 5 minutes receive for 1 hour

TABLE 1-2. QUICK REFERENCE DATA (Sheet 2 of 2)

CONDITIONS	SPECIFICATIONS
Modes of Operation	USB only; Voice, FSK, or CW (f_o +800 cps)
Frequency Range	2 to 11.999 mc in 1-kc increments.
Number of Channels	10,000.
Transmit Power Output (nominal into 50-ohm load)	100 watts peak envelope power (high power) 20 watts peak envelope power (low power)
Receive Sensitivity	Signal-plus-noise to noise ratio of at least 10 db with 2.0 microvolts r-f input and 50 milliwatts minimum audio output.
Receive Selectivity	Response to signals from 300 to 3000 cps above selected channel frequency not more than ±6 db from response to signal 1700 cps above selected channel frequency; response at least -60 db at 4600 cps above and 1000 cps below selected channel frequency.
Receive I-F Rejection	At least 80 db down.
Receive Image Rejection	With reference to 5-microvolt input signals; 80 db from 2.000 to 5.999 mc, 60 db from 6.000 to 9.999 mc, 50 db from 10.000 to 11.999 mc.
Receive Agc Characteristics	Maximum variation of 10 db for input signals of 5 to 100,000 microvolts.
Receive Audio Output	At least 500 milliwatts for 1000-microvolt input.
Receive Audio Distortion	Does not exceed 15 percent for 1000-microvolt r-f input signal and 500-milliwatt output signal.
Receive Over-all Audio Response	Within ±6 db from 300 to 3000 cps with reference to 1700 cps.
Undesired Sideband Rejection	At least 60 db.
Third Order Intermodulation Products	At least 30 db down.
Transmit Carrier Suppression	At least 40 db down.
Harmonic Spurious Emission	Second harmonic at least 35 db down from transmission; all others at least 50 db down from transmission output.
Frequency Stability	±25 cps for 60 days.
Battery Service Conditions	
Ambient Temperature	-25°C to +60°C (-13°F to +140°F).
Shock, Vibration, Inclination	Per MIL-E-16400 except vibration range shall extend to 55 cps.
Humidity	Up to 100 percent, relative.
Altitude	Up to 15,000 feet.
Attitude	Any position.

1-5. EQUIPMENT LISTS.

Table 1-3 lists the equipment supplied as part of the radio set. Table 1-4 lists optional equipment.

TABLE 1-3. EQUIPMENT SUPPLIED (Sheet 1 of 2)

QUANTITY PER EQUIPMENT	NOMENCLATURE		*OVER-ALL DIMENSIONS			*VOLUME	*WEIGHT
	NAME	DESIGNATION	H	W	D		
1	Radio Receiver-Transmitter	RT-671/PRC-47	13-13/32	21-5/32	6-29/32	1.25	40.8
3	Storage Battery	BB-451/U	7-27/32	11-5/8	4-1/8	0.25	17.0
1	Antenna	AS-1320/PRC-47	180 (long)				4.0
	(packed in carrier)		2-1/2	4	24-1/2		
1	Radio Set Case	CY-3700/PRC-47	17	28	20-3/4		65
1	Electrical Power Cable Assembly	CX-8393/PRC-47	50 ft long				6.68
1	Electrical Power Cable Assembly	CX-8395/PRC-47	3 ft long				0.5
1	Electrical Power Cable Assembly	CX-8394/PRC-47	10 ft long				1.5
1	Battery Terminal Adapter	MX-4430/PRC-47	2-3/4	10-27/32	4-3/32		1.8
1	Set, Frame Accessories						1.25
1	Handset	H-33G/PT					1.0
1	Headset	H-~~70C~~ 233 (~~modified~~)					1.12
1	Telegraph Key	J-45					0.88
1	Cable to Connector Adapter	U-239/PRC-47					0.4
1	Loudspeaker	LS-166/U					3.875
1	Antenna	AS-1321/PRC-47	45 ft long				2.5

TABLE 1-3. EQUIPMENT SUPPLIED (Sheet 2 of 2)

QUANTITY PER EQUIPMENT	NOMENCLATURE		*OVER-ALL DIMENSIONS			*VOLUME	*WEIGHT
	NAME	DESIGNATION	H	W	D		
1	Electrical Special Purpose Branched Cable Assembly	CX-8396/PRC-47					0.38
2	(sets) Electrical Equipment Leg	MT-2786/PRC-47	2-1/2	3-7/8	18.0		5.48
1	Rucksack						1.31
2	Rucksack Frames						

*Unless otherwise stated, dimensions are in inches, volume in cubic feet, weight in pounds.

TABLE 1-4. OPTIONAL EQUIPMENT (NOT SUPPLIED)

QUANTITY PER EQUIPMENT	NOMENCLATURE	OVER-ALL DIMENSIONS
~~1~~	~~Vehicle Mounting Kit (includes)~~	
	~~Mounting Brackets and Back-up Plate~~	
	~~Antenna Lead Wire~~	~~3 feet long~~
	~~Antenna Mounting Bracket~~	
~~1~~	~~Blower Kit (includes)~~	
	~~Blower and motor~~	
	~~Connecting hoses~~	
	~~Port adapters~~	
1	Accessories Case CY-3657/PRC-47	10 x 28-7/16 x 16-7/16 inches volume is 2.6 cu. ft.

Change 1

Change 1

SECTION 2
PREPARATION FOR USE AND STOWAGE

2-1. SETTING UP EQUIPMENT.

a. SITE SELECTION. - When setting up Radio Set AN/PRC-47, consider the following:

(1) If possible, set up the radio set on high ground.

(2) Avoid setting up the radio set near large metal structures.

(3) Set up the radio set away from other transmitting equiment, especially if this equipment is operating in the same frequency range.

b. RADIO RECEIVER-TRANSMITTER RT-671/PRC-47.

(1) Set up Radio Receiver-Transmitter RT-671/PRC-47 as follows for the application being used:

(a) For portable application, remove Electrical Equipment Legs MT-2786/PRC-47 from their canvas case, and fasten the legs to the receiver-transmitter. Adjust the legs individually so that the receiver-transmitter is level and stable on the ground.

(b) For fixed station operation, place the receiver-transmitter on a flat surface. If no flat surface is available, use Electrical Equipment Legs MT-2786/PRC-47 as in the portable application to stabilize the receiver-transmitter.

(2) Remove Panel Cover CW-647/PRC-47, secure it to the side of the receiver-transmitter case, and connect the panel-mounted ground terminals to a good ground.

(3) Check that the POWER-LIGHTS switch on the receiver-transmitter control panel is at POWER OFF.

c. ANTENNA.

(1) Select the antenna to be used. Antenna AS-1321/PRC-47 provides more efficient operation than Antenna AS-1320/PRC-47 for transmission between 2 and 9 megacycles. From 9 to 12 megacycles, the efficiency of the whip antenna is comparable to that of a long-wire antenna and is preferable because of its ease of setting up. If the radio set is mounted on a vehicle, use the vehicular antenna because the whip antenna supplied with the radio set may break if struck by an obstruction. In a fixed station setup, use either Antenna AS-1321/PRC-47, Antenna AS-1320/PRC-47, or any 50-ohm antenna suitable for the desired frequency.

(2) Set up the selected antenna as follows:

WARNING

Do not connect the power cable before connecting the antenna. High r-f voltages are present on the ANTENNA connector when transmitter power is on.

(a) To set up Antenna AS-1320/PRC-47, use the following procedure:

1. Remove the antenna from its case.

2. Assemble the antenna before mounting it on the control panel. Assemble in order, beginning with insulated base section, and continuing with three large-diameter sections, the large-to-small adapter section, three small-diameter sections, and the tip section.

3. Tighten the sections securely by hand; do not use pliers.

4. Connect the antenna to the ANTENNA connector on the control panel of the receiver-transmitter.

(b) To set up Antenna AS-1321/PRC-47, use the following procedure:

1. Remove the antenna from the accessories rucksack.

2. Connect the adapter to the ANTENNA connector on the control panel of the receiver-transmitter.

3. Set up the long-wire antenna on masts, or attach it to a tree or building. Use insulation to prevent grounding.

NOTE

The antenna should be set up as high as possible for efficient operation.

4. Use the jumpers to select the correct antenna length for the operating frequency: 45 feet for 2 to 5 megacycles, 25 feet for 2 to 9 megacycles, and 15 feet for 2 to 12 megacycles.

5. If convenient, the long-wire antenna may also be clamped to the exposed male connector of one of the lower sections of the AS-1320/PRC-47 instead of attaching the adapter directly to the antenna bowl.

(c) To set up vehicular antenna and fixed station antenna, use the following procedure:

1. Remove the antenna terminal adapter from the long-wire antenna.

2. Assemble the antenna lead wire (optional) to the antenna terminal adapter. Connect the antenna terminal adapter to the ANTENNA connector on the receiver-transmitter control panel.

CAUTION

The over-all length of the lead-in and the antenna should not exceed the lengths stated in paragraph 3-3*d*(9) for the operating frequency.

3. Connect the antenna lead wire to the vehicular or fixed station antenna.

d. ANTENNA GROUND PLANE. - Set up the antenna ground plane unless the receiver-transmitter chassis can be grounded to a vehicle or fixed station ground. Unwind the eight wires from Electrical Equipment Legs MT-2786/PRC-47. Connect the short wire and pins (attached to each pair of legs) to the grounding terminal at each end of the receiver-transmitter control panel. Spread the wires out in a symmetrical radial pattern as shown in figure 1-2.

e. POWER CONNECTION. - Depending on the available power, connect a power cable from the POWER receptacle on the control panel of receiver-transmitter as follows:

CAUTION

Make sure that the correct cable is used for primary power connections. Do not interchange Electrical Power Cable Assembly CX-8393/PRC-47 (50-foot a-c power cable) for Electrical Power Cable Assembly CX-8394/PRC-47 (10-foot d-c power cable) or Electrical Power Cable Assembly CX-8395/PRC-47 (three-foot battery power cable).

(1) D-C GENERATOR. - Connect Electrical Power Cable Assembly CX-8394/PRC-47 to a 26.5-volt, d-c generator. The cable connections may be made directly across the vehicle battery terminals.

(2) A-C LINE. - Connect Electrical Power Cable Assembly CX-8393/PRC-47 to the 115-volt, 400-cps, single-phase line.

(3) NO EXTERNAL POWER AVAILABLE. - If no external power is available, connect Electrical Power Cable Assembly CX-8395/PRC-47 to the silver-zinc battery. Set the silver-zinc battery in the upright position. The silver-zinc batteries may be charged using Battery Charger PP-3240/U. The charging curves for the battery charger are shown in figure 2-1. These curves are plotted for temperature of +72°F (+22°C).

f. POWER CHECK.

(1) Set POWER-LIGHTS switch to POWER ON.

(2) Press BATTERY TEST pushbutton, and check that meter reads in the white area. If the meter does not deflect, check the fuse for the power being used (refer to paragraph 3-5*b*). If the meter deflects but is not in the white area, check the power source.

(3) Set POWER-LIGHTS switch to LIGHTS OFF.

g. AUDIO ACCESSORIES. - Connect audio accessories as follows for the type of operation desired.

(1) VOICE OPERATION. - Connect Handset H-33G/PT to either AUDIO receptacle on the control panel of the receiver-transmitter. If loudspeaker operation is desired, connect Loudspeaker LS-166/U to either AUDIO receptacle.

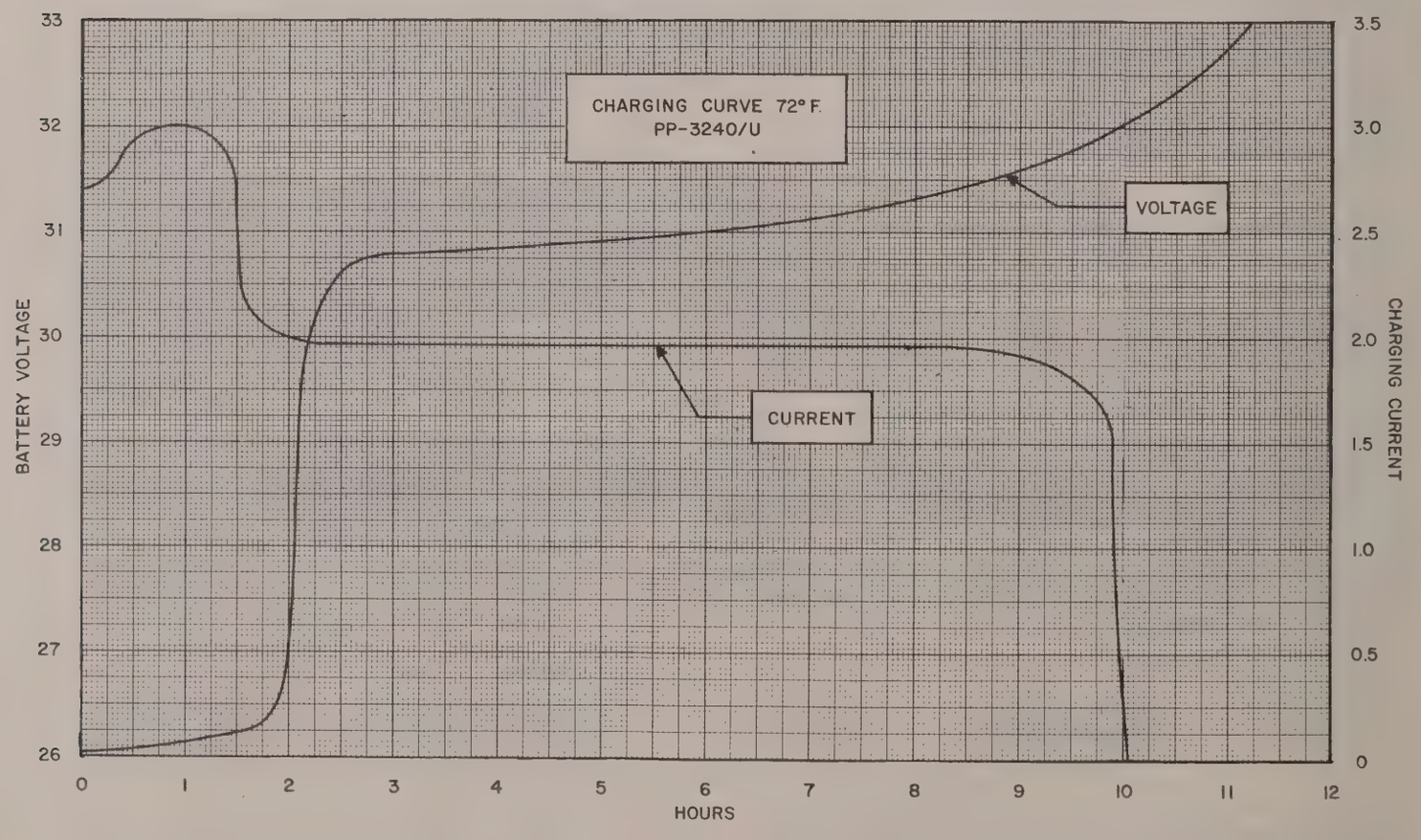


Figure 2-1. Battery Charger PP-3240/U, Charging Curves

(2) CW OPERATION. - Connect Headset H-233 and Telegraph Key J-45 to the audio cable. Connect the audio cable to either AUDIO receptacle on the control panel of the receiver-transmitter.

(3) FREQUENCY SHIFT KEYING OPERATION. - Connect Cable to Connector Adapter U-239/PRC-47 to either AUDIO receptacle on the receiver-transmitter control panel. Connect teletypewriter terminal equipment to the adapter.

(4) REMOTE OPERATION. - Connect Control Group AN/GRA-6 to either AUDIO receptacle on the control panel of the receiver-transmitter.

2-2. DISMANTLING THE EQUIPMENT.

a. Before dismantling the equipment, check that the POWER-LIGHTS switch on the receiver-transmitter is at POWER OFF.

b. Disconnect the electrical power cable assembly and Electrical Special Purpose Branched Cable Assembly CX-8396/PRC-47.

c. Disconnect the antenna. Coil and store the long-wire antenna. Place Antenna AS-1320/PRC-47 in its own case.

d. Mount and secure Panel Cover CW-647/PRC-47.

e. Remove the electrical equipment legs from the receiver-transmitter. Wind the ground plane wires around the legs. Wind two wires on each leg.

f. Place the legs in their own case.

2-3. STOWING THE EQUIPMENT IN PORTABLE PACKS.

a. Mount the support plate assembly to the shoulder strap assembly with two screws, with washers, split locks, and nuts as shown in figure 2-2.

b. Assemble shoulder strap assembly to frame by pushing down on top curve and snapping in place.

c. Secure the support plate assembly to the case of receiver-transmitter, using the two screws shown in figure 2-2. These two screws are secured to the support plate assembly by screws and chains.

d. Using two screws, knurled nuts, and nylon clamps, secure the bottom of the frame to the receiver-transmitter case.

e. Install the shoulder strap billets, quick-release fasteners, and the back strap as shown in figure 2-2.

f. Place the pack on the man's back, and adjust the shoulder strap billets for proper tension with quick-release clamps closed. The pack may be removed by unhooking the quick-release fasteners and sliding the straps off the shoulders while the receiver-transmitter and frame are supported from behind by another man. This completes stowage of receiver-transmitter on rucksack frame.

g. Hook one of the hooks on the battery retainer (depending upon which style of frame is used) under the cross member of the rucksack frame, and secure the retainer to the frame using two screws and two nylon clamps as shown in figure 2-3.

h. Install back strap on frame. Install the silver-zinc battery on the battery retainer, and secure with the strap provided.

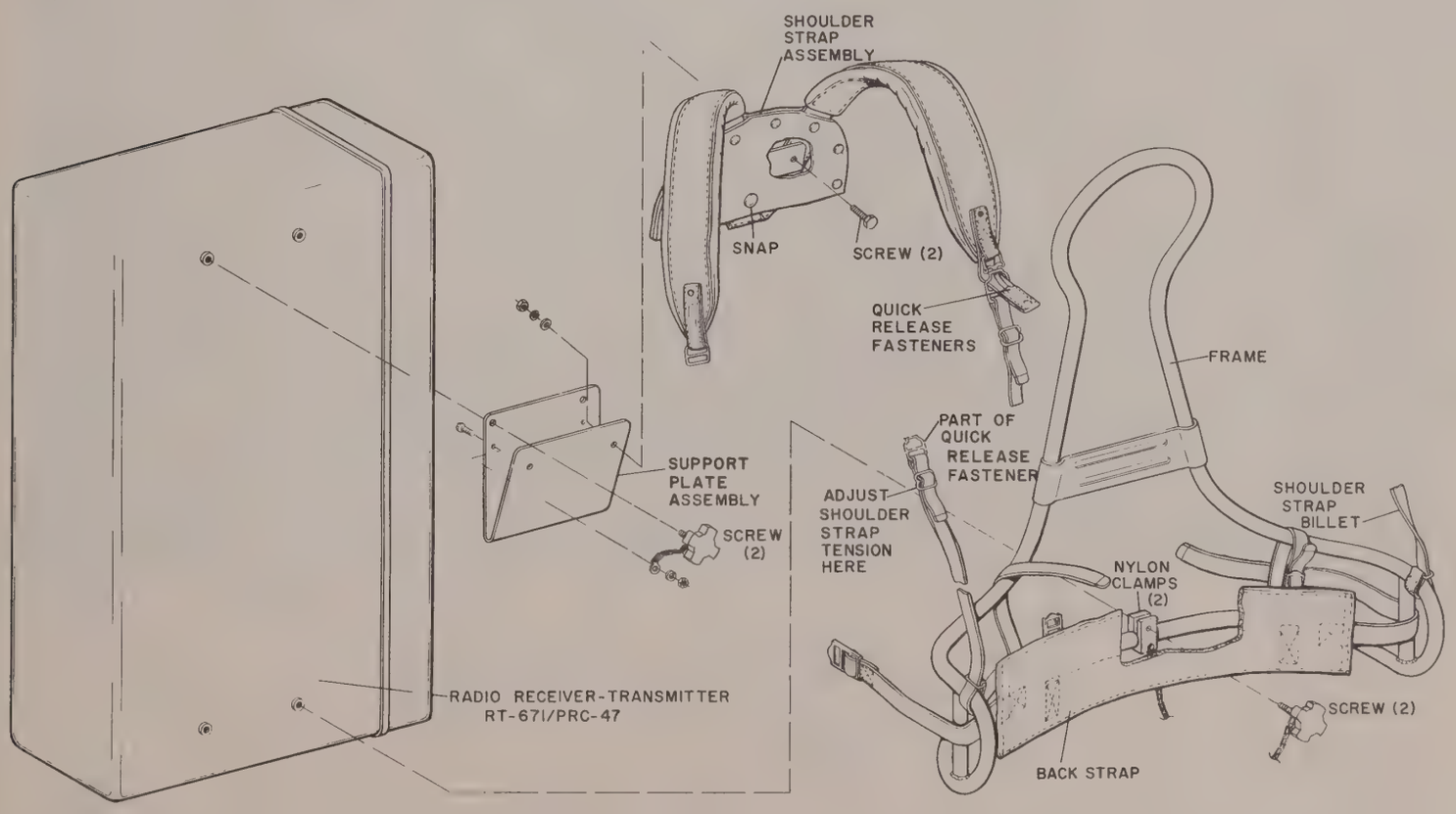


Figure 2-2. Packing Radio Receiver-Transmitter RT-671/PRC-47 on Rucksack Frame

i. Install the rucksack and shoulder strap assembly on the top of the frame, and snap to secure. Run the two straps shown in figure 2-3 through the two buckles on the battery retainer, pull tight, and secure. This holds frame, battery and battery retainer, and rucksack-shoulder strap assembly as one unit.

j. Pack Electrical Equipment Legs MT-2786/PRC-47 and Antenna AS-1320/PRC-47 in their respective cases, and secure to the side of the pack with straps as shown in figure 2-4.

k. Install the shoulder strap billets and quick-release fasteners as shown in figure 2-4.

l. Place the following accessories (or the specific accessories needed) in the rucksack, and secure its cover with the straps and buckles provided:

Antenna AS-1321/PRC-47
Electrical Power Cable Assembly CX-8395/PRC-47
Electrical Special Purpose Branched Cable Assembly CX-8396/PRC-47
Handset H-33G/PT
Headset H-233
Telegraph Key J-45
Loudspeaker LS-166/U

m. Place the pack on a man's back, and adjust the shoulder strap billets for proper tension with the quick-release clamps closed. The pack may be removed from the man's back by unhooking the quick-release fasteners and sliding the straps off the shoulders while the pack is supported from the rear by another man. This completes stowage of the accessories on the rucksack frame.

2-4. STOWING THE EQUIPMENT IN THE RADIO SET CASE.

When it is desired to store the equipment or transport it by vehicle, the radio set should be stowed in Radio Set Case CY-3700/PRC-47. Place the equipment in the radio set case as shown in figure 2-4. Fit the lower tray over the spare batteries, and fit the upper tray with one end over the lower tray and the other end over the silver-zinc battery and the accessories rucksack.

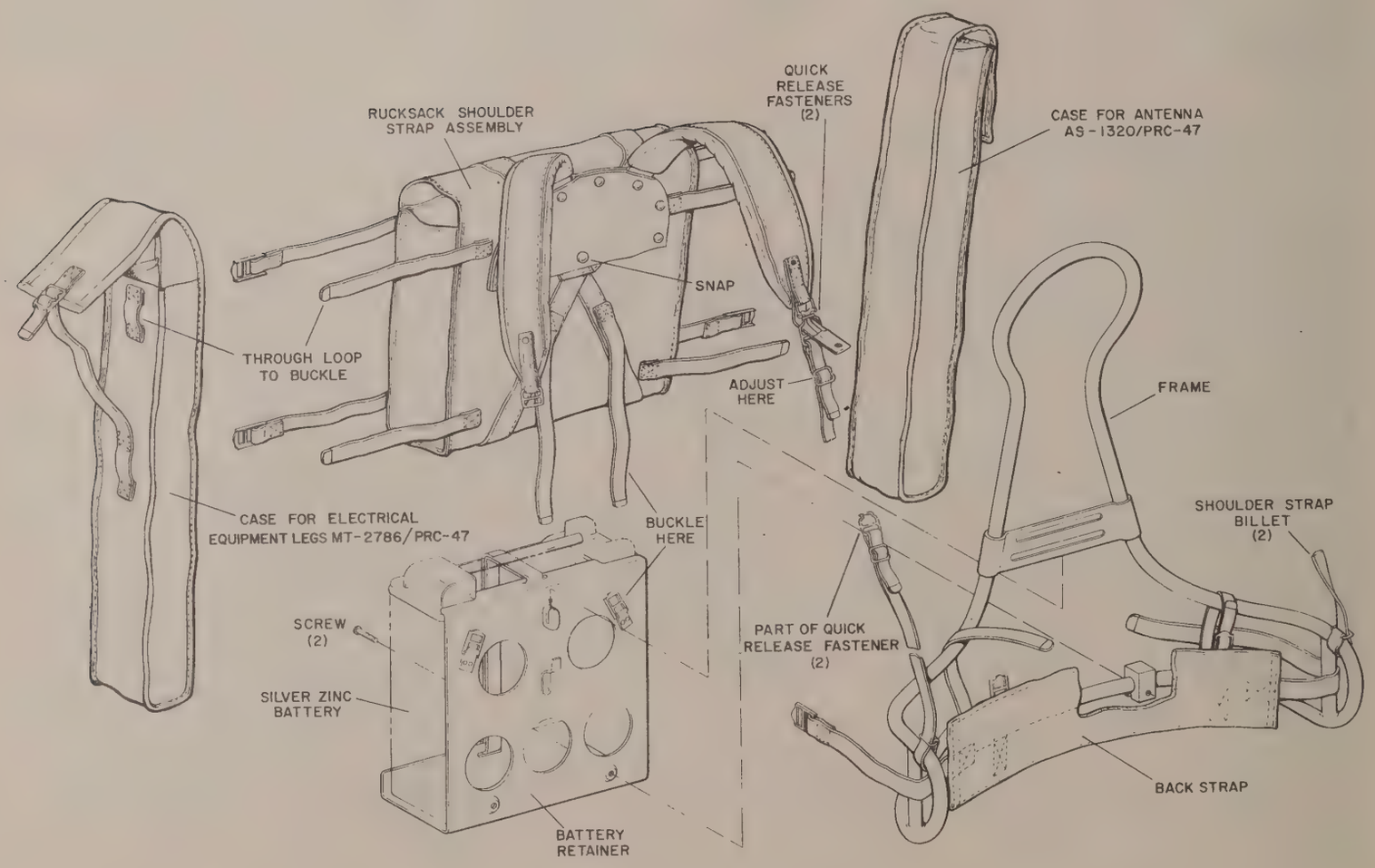


Figure 2-3. Packing Accessories on Rucksack Frame

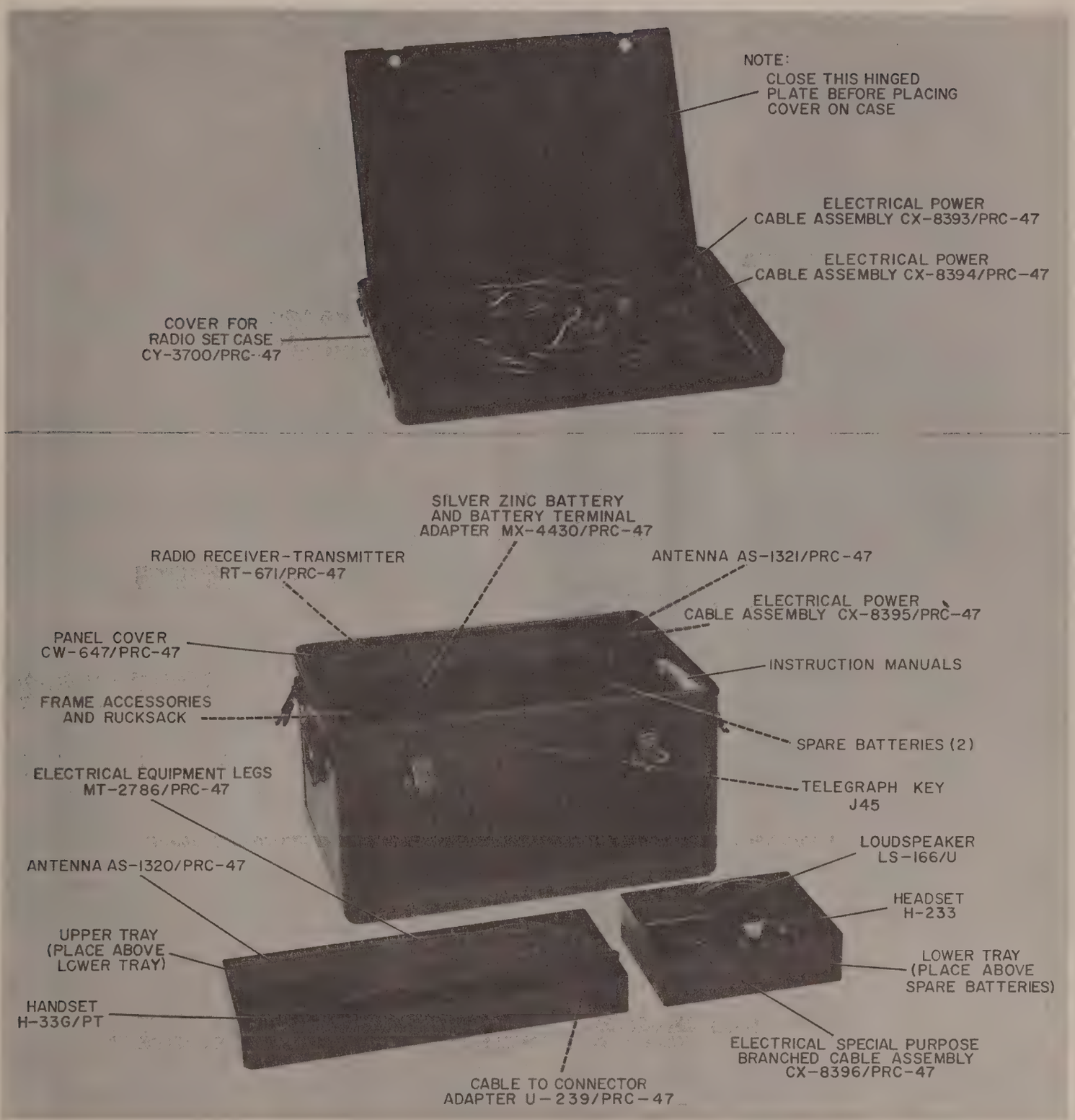

NOTE:
CLOSE THIS HINGED PLATE BEFORE PLACING COVER ON CASE
ELECTRICAL POWER CABLE ASSEMBLY CX-8393/PRC-47
ELECTRICAL POWER CABLE ASSEMBLY CX-8394/PRC-47
COVER FOR RADIO SET CASE CY-3700/PRC-47
SILVER ZINC BATTERY AND BATTERY TERMINAL ADAPTER MX-4430/PRC-47
RADIO RECEIVER-TRANSMITTER RT-671/PRC-47
ANTENNA AS-1321/PRC-47
ELECTRICAL POWER CABLE ASSEMBLY CX-8395/PRC-47
PANEL COVER CW-647/PRC-47
INSTRUCTION MANUALS
FRAME ACCESSORIES AND RUCKSACK
SPARE BATTERIES (2)
ELECTRICAL EQUIPMENT LEGS MT-2786/PRC-47
TELEGRAPH KEY J45
LOUDSPEAKER LS-166/U
ANTENNA AS-1320/PRC-47
HEADSET H-233
UPPER TRAY (PLACE ABOVE LOWER TRAY)
LOWER TRAY (PLACE ABOVE SPARE BATTERIES)
HANDSET H-33G/PT
ELECTRICAL SPECIAL PURPOSE BRANCHED CABLE ASSEMBLY CX-8396/PRC-47
CABLE TO CONNECTOR ADAPTER U-239/PRC-47

Figure 2-4. Packing Radio Set Case CY-3700/PRC-47

SECTION 3
OPERATOR'S SECTION

3-1. FUNCTIONAL OPERATION.

a. GENERAL. - Radio Set AN/PRC-47 consists of Radio Receiver-Transmitter RT-671/PRC-47 together with silver zinc battery and both audio and antenna accessories. The set provides voice communication (USB), CW communication, or frequency shift keying (FSK) communication. The operating frequency may be selected in 1-kilocycle increments within the range of 2.0 to 11.999 megacycles. The radio set may be operated with a remote control.

NOTE

A summary of operating instructions is printed inside Panel Cover CW-647/PRC-47.

b. RECEPTION. - When the radio set is used for reception, the operator selects the desired communication frequency. The selected frequency is indicated by a counter-type dial on the receiver-transmitter control panel.

c. TRANSMISSION. - When the radio set is used for transmission, it must be tuned properly for the selected transmission frequency. This is done by switching to the tune mode. In this mode, the receiver-transmitter generates an internal 800-cps audio tone which is transmitted as an r-f carrier at the selected frequency plus 800 cps. The transmitted output is monitored by a meter on the control panel of the receiver-transmitter. The operator adjusts tune and load controls on the control panel until the meter indicates a maximum transmission level. Tuning of the radio set for transmission is accomplished in two steps. First, the tone-generated carrier is transmitted at a low-power level, and adjustments of the tune and load controls are made. The receiver-transmitter is now ready for the transmission at low power. For high-power transmission, additional tuning and loading adjustments are required. This assures the operator of optimum transmission efficiency and amplifier protection.

After the radio set has been properly tuned, it is switched to the operate mode, and transmission can begin. Transmission can be made at full power or at reduced power. Using Antenna AS-1320/PRC-47 and full power, the radio set radiates from 20 to 76 watts peak envelope power as the frequency is varied from 2 to 12 megacycles; in the reduced power mode, the radio set radiates from 4 to 15 watts peak envelope power as the frequency is varied from 2 to 12 megacycles.

The radio set may be operated remotely if transmission frequency change is not required. Tuning must be performed at the radio set.

In all transmitting modes, sidetone is fed to the headset or loudspeaker. This indicates to the operator that an r-f signal is being transmitted.

NOTE

A protective thermal switch (cutout) disables the power amplifier and the high-voltage power supply when temperature of the power amplifier exceeds a preset level. This will occur if the power amplifier is operated for excessive transmission time or if it is operated off resonance. Such an interruption of service should warn the operator to recheck tuning and loading and to keep transmission periods within specified time limits.

d. VOICE COMMUNICATION. - When the operator wishes to transmit as well as receive voice communication, he operates a push-to-talk switch at Handset H-33G/PT. This turns on the high-voltage power supply in the receiver-transmitter. However, the radio set continues to operate as a receiver until the operator begins talking. When he talks, the audio energy automatically switches the radio set to transmission. A lag time prevents the radio set from switching back to reception between words in normal speech. If the operator intends to continue reception for more than a few seconds, he releases the push-to-talk switch on the handset. This turns off the high-voltage power supply and reduces power consumption. The power consumed in the reception mode is less than 1/25 of the power consumed in the transmission mode.

e. CW COMMUNICATION. - If the operator wishes to transmit as well as receive CW signals, he sets the CW-FSK/VOICE switch on the receiver-transmitter to the CW-FSK position. This turns on the high-voltage power supply. However, the radio set continues to operate as a receiver until the telegraph key is closed. The telegraph key keys an 800-cps tone which generates an r-f carrier for transmission at the selected frequency. When the key is depressed, the transmitted signal is 800 cps above the selected channel frequency. The radio set does not switch back to reception as long as the keying rate is five words per minute or more. If the operator wishes to continue with CW reception only, he should switch the CW-FSK/VOICE switch to VOICE. This turns off the high-voltage power supply and conserves power.

f. FREQUENCY SHIFT KEYING OPERATION. - When the operator wishes to transmit frequency shift keying signals, he must set the CW-FSK/VOICE switch to CW-FSK, thereby turning on the high-voltage power supply. Audio tones are then supplied to the receiver-transmitter by the frequency shift keying unit (not part of the radio set). The receiver-transmitter

transmits these tones at the selected frequency. If the operator wishes to continue with FSK reception only, he should switch the CW-FSK/VOICE switch to VOICE. This turns off the high-voltage power supply and conserves power.

g. BATTERY OPERATION AND RECHARGING. - The operator should note the approximate ampere-hours charge available in each of the three silver zinc batteries and select the one which will most adequately fill his needs for the operating period. The charge condition of each battery is indicated on a visual charge indicator. If the indicator shows that the battery is discharged or nearly so, the battery should be recharged using Battery Charger PP-3240/U. The charging curves for this operation are shown in figure 2-1. Each time a battery is charged, the operation should make an entry in the charge log on the inside of the battery cover. To place the battery in service, the operator will install Battery Terminal Adapter MX-4430/PRC-47 on the battery, and connect to the radio set with Electrical Power Assembly CX-8395/PRC-47. Condition of the battery during operation may be checked by pressing the BATTERY TEST pushbutton on the receiver-transmitter panel. While the BATTERY TEST switch is depressed, XMTR OUTPUT will indicate the condition of battery voltage.

3-2. DESCRIPTION OF CONTROLS.

a. RADIO RECEIVER-TRANSMITTER RT-671/PRC-47. - The control panel of the receiver-transmitter is illustrated in figure 3-1. The controls, indicators, and connectors on this panel are described in table 3-1.

b. HANDSET H-33G/PT. - Handset H-33G/PT contains a push-to-talk switch which turns on the high-voltage power supply in the receiver-transmitter for transmission.

3-3. OPERATING PROCEDURES.

a. BEFORE AND AFTER USE. - Before and after use of the radio set, the POWER-LIGHTS switch should be kept in the POWER OFF position to conserve power.

b. TURNING ON RADIO SET FOR RECEPTION.

(1) Set XMTR PWR switch to OFF, and set the OPR-TUNE switch to OPR.

TABLE 3-1. RADIO RECEIVER-TRANSMITTER RT-671/PRC-47 CONTROLS, INDICATORS, AND CONNECTORS (Sheet 1 of 2)

CONTROL, INDICATOR, OR CONNECTOR	DESCRIPTION
ANTENNA Connector	Connects the antenna to the receiver-transmitter.
XMTR OUTPUT Meter	During tuning of the power amplifier, indicates the relative transmission power level. For optimum tuning and loading of the antenna, the power level is at a maximum.
M ADJ Control	Provides control of the sensitivity of the XMTR OUTPUT meter. Does not affect meter reading when BATTERY TEST pushbutton is pressed.
OPR-TUNE Switch	In TUNE position, the OPR-TUNE switch turns on an 800-cps oscillator and the high-voltage power supply. In the OPR position, the 800-cps oscillator and the high-voltage power supply are controlled by other switches.
XMTR PWR Switch	Selects either full transmission power or reduced transmission power. In OFF position, disables power amplifier plate and screen voltages.
POWER AMPLIFIER LOAD Control	During tuning, adjusts the power amplifier for maximum power output. This is indicated by a maximum reading on the XMTR OUTPUT meter.
POWER AMPLIFIER TUNE Control	During tuning, adjusts the power amplifier to resonance at the selected transmission frequency. This is indicated by a maximum reading on the XMTR OUTPUT meter.
AUDIO Receptacles	Connect voice and CW audio accessories. Either or both may be used.
VOLUME Control	During reception, adjusts the received audio level. During transmission, this control adjusts the sidetone level.

TABLE 3-1. RADIO RECEIVER-TRANSMITTER RT-671/PRC-47
CONTROLS, INDICATORS, AND CONNECTORS (Sheet 2 of 2)

CONTROL, INDICATOR, OR CONNECTOR	DESCRIPTION
POWER-LIGHTS Switch	Switches primary power to the radio set on or off, and, in addition, adjusts the level of panel lighting. The switch has three POWER ON positions, one for LIGHTS OFF, one for LIGHTS HI, and one for LIGHTS LO.
POWER Receptacle	Connects primary power to the receiver-transmitter.
Frequency Controls	Selects operating frequency of the receiver-transmitter.
KILOCYCLES Indicator	Provides a direct reading of the selected operating frequency in kilocycles.
BATTERY TEST Pushbutton	Connects the XMTR OUTPUT meter to the 26-volt leads to provide an indication that the power supply voltage in the receiver-transmitter is within the allowable tolerances. This check is especially important when a battery power supply is being used.
CW-FSK/VOICE Switch	In the CW-FSK position, switches on the high-voltage power supply for transmission.
Grounding Terminals	Connect ground plane or external ground plane to the receiver-transmitter.
Audio Rain Cap	Protects 10-pin audio receptacle not in use. Always attach rain cap to unused audio receptacle.

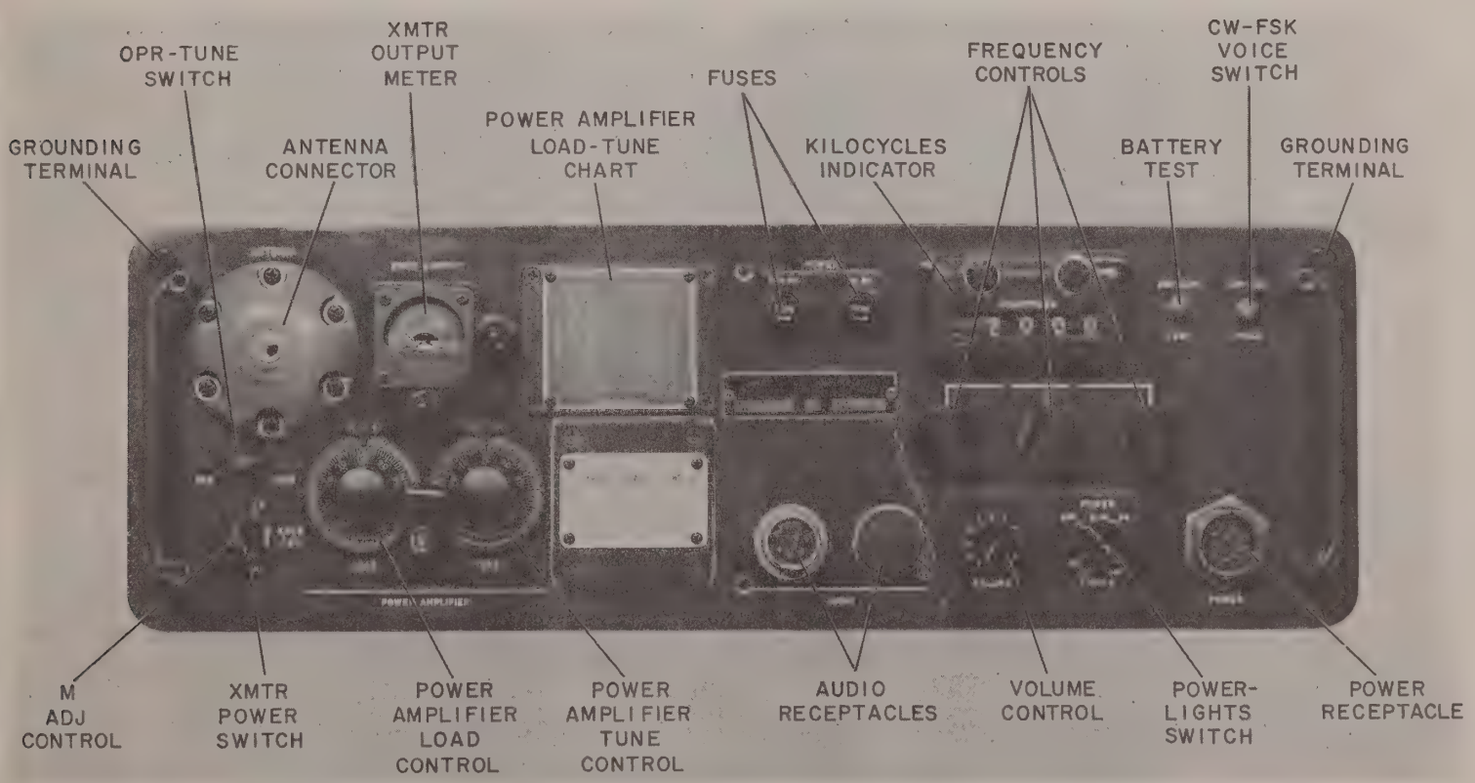


Figure 3-1. Radio Receiver Transmitter RT-671/PRC-47 Control Panel

(2) Set the CW-FSK/VOICE switch to VOICE.

NOTE

When the CW-FSK/VOICE switch is in the CW-FSK position, Radio Set RT-671/PRC-47 is ready for transmit and will not receive. To receive the CW-FSK/VOICE switch must be set to the VOICE position.

(3) Set the POWER-LIGHTS switch to POWER ON. Allow at least one minute warmup time. If necessary, set the POWER-LIGHTS switch to one of the LIGHTS positions (HI or LO) for panel lighting.

NOTE

To conserve power, use the panel lights only when setting the operating frequency.

(4) Set the operating frequency with the three frequency controls. The frequency range is 2000 to 11,999 kilocycles in 1-kilocycle steps.

(5) If the panel lights are on, place the POWER-LIGHTS switch to LIGHTS OFF (power still on).

(6) Adjust the VOLUME control for good listening level from the headset or earphones.

NOTE

On the top three channels of each band (that is, X.997, X.998, and X.999) proper reception may be hampered due to spurious responses (birdies). This is a normal operating characteristic of the radio.

c. TURNING ON RADIO SET FOR TRANSMISSION.

WARNING

Do not touch the antenna above the insulating boot when the radio set is being used for transmission. Severe burns may result due to high voltage at radio frequencies.

(1) Check that the XMTR PWR switch is at OFF.

(2) Set the OPR-TUNE switch to OPR.

(3) Set the CW-FSK/VOICE switch to VOICE.

(4) Check that the push-to-talk switch, on the audio accessory being used, is released.

(5) Set the POWER-LIGHTS switch to POWER ON. Allow at least one minute warmup time. If necessary, set the POWER-LIGHTS switch to one of the LIGHTS positions (HI or LO) for panel lighting.

NOTE

To conserve power, use the panel lights only when setting the operating frequency or when tuning and loading the power amplifier.

(6) Set the operating frequency with the three frequency controls. The frequency range is 2000 to 11,999 kilocycles in 1-kilocycle steps.

(7) If the power amplifier was previously tuned and loaded for the selected frequency with the equipment in the same setup, proceed with step (8). Otherwise, tune and load the power amplifier for the selected frequency. If Antenna AS-1320/PRC-47 or Antenna AS-1321/PRC-47 is being used, follow the tuning procedures of paragraph 3-3*d*. If a 50-ohm antenna is being used, follow the tuning procedures of paragraph 3-3*e*. When the power amplifier is properly tuned, proceed with step (8).

WARNING

During tuning, as well as during transmission, do not permit transmitter operation to exceed the duty cycles stated in table 1-2.

(8) Set the CW-FSK/VOICE switch to the desired mode of operation. For voice transmission, set the switch to VOICE. For CW or FSK transmission, set the switch to CW-FSK.

(9) To transmit at low power, set the XMTR PWR switch to LO. For high power set switch to HI.

(10) Attach the desired audio accessories, and adjust the VOLUME control for a desired sidetone level while set is transmitting.

(11) To change transmission frequency, repeat steps (5), (6), and (7).

d. TUNING RADIO RECEIVER-TRANSMITTER RT-671/PRC-47 FROM TRANSMISSION WITH ANTENNA AS-1320/PRC-47 OR ANTENNA AS-1321/PRC-47.

NOTE

Do not perform this procedure unless steps (1) through (7) of paragraph 3-3*c* have been completed.

(1) Refer to the POWER AMPLIFIER LOAD-TUNE chart (see figure 3-2), and find the operating frequency on the FREQUENCY (MC) line (bottom horizontal line).

(2) From the operating frequency point on the FREQUENCY (MC) line in step (1) above, trace an imaginary line vertically to the LOAD line for the length of antenna being used on the chart.

(3) From the LOAD line intersection found in step (2) above, trace an imaginary line horizontally to the left to KNOB TURNS line on the left-hand side of the chart.

(4) From the KNOB TURNS intersection found in step (3) above, read the approximate number of the knob turns in the KNOB TURNS line. This is the number of turns from the zero position that the POWER AMPLIFIER LOAD control has to be turned (see next step). Refer to figure 3-3.

(5) Rotate the POWER AMPLIFIER LOAD control until the pointer above the control is positioned to the correct control turns as shown in the outer scale. The outer scale is numbered from zero to 39, and each number represents the number of turns of the POWER AMPLIFIER LOAD control from its zero position; the

outer scale numbers correspond to the numbers read on the KNOB TURNS line on the LOAD-TUNE chart. The inner scale, which is numbered from zero through 100, makes one complete revolution for each number change (one control turn) of the outer scale and is used for fine loading.

(6) Repeat the procedure in steps (1) through (5) above for setting the POWER AMPLIFIER TUNING control. Find the operating frequency on the FREQUENCY (MC) line of the LOAD-TUNE chart, trace an imaginary line vertically to the TUNE line on the chart; trace an imaginary line horizontally from the TUNE line intersection to the KNOB TURNS line, and read the number of control turns from the zero position to which the POWER AMPLIFIER TUNE control should be set. The outer scale and the inner scale on the POWER AMPLIFIER TUNE control are the same as on the POWER AMPLIFIER LOAD control (see figure 3-3 and the following example).

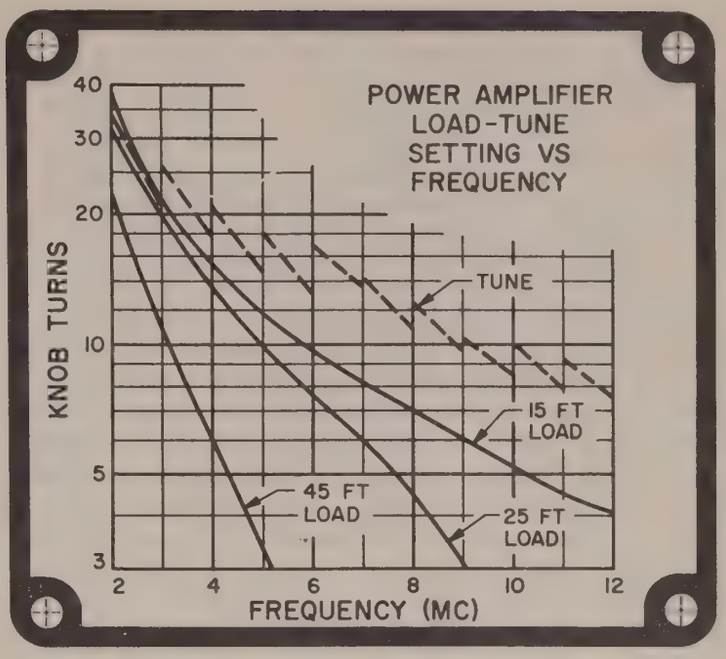


Figure 3-2. Power Amplifier Load-Tune Chart

EXAMPLE

As an example of the initial setting of the POWER AMPLIFIER LOAD and the POWER AMPLIFIER TUNE controls, assume that a 15-foot antenna is being used and that the receiver-transmitter is set at 7000 kilocycles. This corresponds to a reading of 7.0 mc on the FREQUENCY (MC) line on the chart. Following the 7.0-megacycle line vertically to the 15-foot LOAD line and then going horizontally from this intersection to the KNOB TURNS line, it is seen that the POWER AMPLIFIER LOAD control should be set at approximately eight turns from the zero position. This means that the POWER AMPLIFIER LOAD control should be set at 8 on the outer scale and 0 on the inner scale. Using the same procedure to find the POWER AMPLIFIER TUNE control turns, it is seen that the POWER AMPLIFIER TUNE control should be set at 14 on the outer scale and at 0 on the inner scale. Both of these adjustments are coarse tuning and loading. Fine tuning and loading are performed in steps (7) through (13).

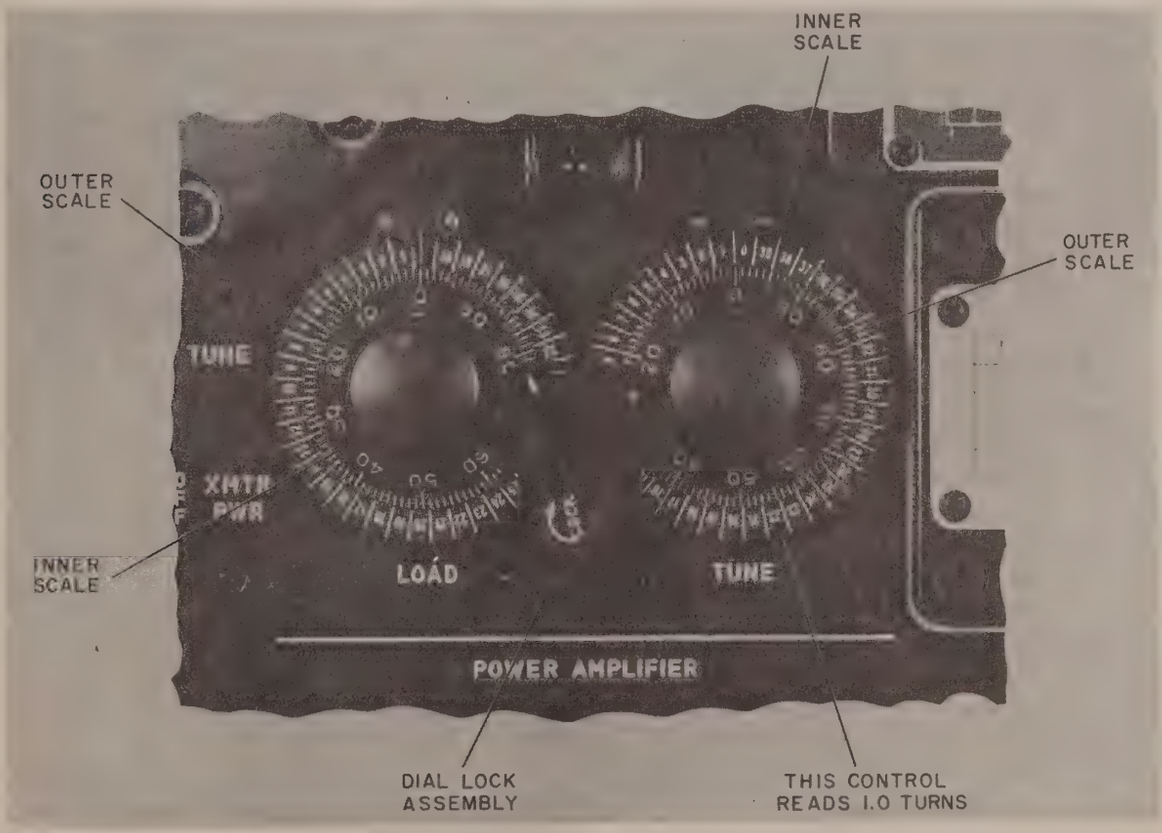


Figure 3-3. Load and Tune Controls

(7) Set the XMTR PWR switch to LO.
(8) Set the OPR-TUNE switch to TUNE.

NOTE

While tuning and loading, continue to adjust the the M ADJ control to keep the needle above midscale on peak readings. To prevent damage to the meter, do not allow the needle to be pegged. Counterclockwise rotation of the control reduces meter sensitivity.

(9) If the antenna being used is longer than 15 feet, check for crossover frequencies. Do not operate the radio set at or above crossover frequencies; shorten the antenna. Crossover frequencies can be noted when the XMTR OUTPUT meter continues to show an increasing power output as the POWER AMPLIFIER LOAD control is turned counterclockwise (decreasing load) as far as possible (position 0 on outer scale). A crossover frequency is a frequency of operation at which the antenna in use is too long to allow proper tuning and loading of the power amplifier by use of the TUNE and LOAD controls. Figure 3-2 shows frequency ranges for 15-foot, 25-foot, and 45-foot antenna lengths. The chart in the figure is the same chart which is affixed to the plate on the front panel of Radio Receiver-Transmitter RT-671/PRC-47. The word "load" on the chart refers to antenna. The chart of figure 3-2 shows that a 15-foot antenna may be used for the entire range of the RT-671/PRC-47, a 25-foot antenna may be used for frequencies between 2 megacycles and 9 megacycles, a 45-foot antenna may be used for frequencies between 2 megacycles and 5 megacycles.

(10) Adjust the POWER AMPLIFIER LOAD and the POWER AMPLIFIER TUNE controls in either direction for a maximum reading on the XMTR OUTPUT meter. Do not change the settings more than three turns in either direction from the initial settings made in steps (5) and (6) above. Note this peak reading on the meter.

(11) Rotate the POWER AMPLIFIER LOAD control clockwise (increasing load) until the indication on the XMTR OUTPUT meter drops one or two scale divisions. Then readjust the POWER AMPLIFIER TUNE control in either direction for maximum output indication on the meter. Note this peak reading on the meter.

(12) If the peak meter reading obtained in step (11) above is greater than the peak meter reading obtained in step (10) above, repeat step (11) above until an absolute maximum output is obtained on the XMTR OUTPUT meter.

(13) If the peak meter reading obtained in step (11) above is less than the peak meter reading obtained in step (10) above, rotate the POWER AMPLIFIER LOAD control counterclockwise (decreasing load) until the indication on the XMTR OUTPUT meter drops two or three scale divisions. Then readjust the POWER AMPLIFIER TUNE control in either direction for a maximum output indication on the meter. Repeat this step until an absolute maximum output is obtained on the meter.

(14) Set the XMTR PWR switch to HI.

(15) Repeat steps (10) through (13) above. Only slight adjustments should be necessary. Use the M ADJ control to keep the meter needle near midscale.

(16) Set the OPR-TUNE switch to OPR.

(17) If the panel lights are on, set the POWER-LIGHTS switch to LIGHTS-OFF (power still on).

(18) Proceed with step (8) in paragraph 3-3*c*.

e. TUNING RADIO RECEIVER-TRANSMITTER RT-671/PRC-47 FOR TRANSMISSION WITH 50-OHM ANTENNA.

NOTE

Do not perform this procedure unless steps (1) through (7) of paragraph 3-3*c*. have been completed.

(1) If the antenna impedance is 50 ohms, rotate the POWER AMPLIFIER LOAD control to near 0 on the outer scale.

(2) Set the POWER AMPLIFIER TUNE control as described in step (6) of paragraph 3-3*d*.

(3) Perform steps (8) through (18) of paragraph 3-3*d*.

f. PRECAUTIONS DURING USE. - Observe the following precautions during use of the radio set.

(1) Do not touch the antenna during transmission. Severe burns may result due to high voltage at radio frequencies.

(2) Do not operate CW, FSK, or voice transmission more than 1 minute out of every 10 at high power. At low power, do not exceed 2 minutes out of every 11 as noted in table 1-2. There are not limitations on reception. If the thermal cutout disables the transmitter circuits, wait until the power amplifier has cooled, recheck tuning and loading, and keep transmission period within the specified limits.

(3) Do not leave panel lights on after the power amplifier has been tuned. This is necessary to conserve power when operating from the silver-zinc battery.

(4) Keep the high-voltage power supply turned off as much as possible to conserve power. For any type of reception, keep the CW-FSK/VOICE switch in the VOICE position. Use the CW-FSK position only when CW or FSK transmission is required. For voice transmission, use the VOICE position and keep the push-to-talk switch at the handset in the released position as much as possible.

3-4. EMERGENCY OPERATION.

If the radio set fails to operate properly, the trouble may be limited to one function of the equipment. If continued communication is essential, try the following:

a. Press the BATTERY TEST pushbutton. If the meter indicates that no power is available, replace the fuse (refer to paragraph 3-5*b*).

b. Switch to low-power transmission by setting the XMTR PWR switch to LO.

c. Switch to different audio accessories.

d. In the case when the thermal cutout circuit is energized and emergency operation is desired, the thermal cutout relay can be bypassed by holding the BATTERY TEST switch to the TEST position and sending as in normal operation.

3-5. OPERATOR'S MAINTENANCE.

a. ROUTINE CHECKS. - Check operation of the radio set using the routine check chart, table 3-2.

b. FUSES. - Line fuses for a-c and d-c primary power are on the control panel of the receiver-transmitter. If the radio set does not operate, check the appropriate fuse. Turn the fuse holder 1/4 turn, and extract it from the panel. Then remove the fuse from the fuse holder. Spare fuses are in the cover of the receiver-transmitter case. If the fuse must be replaced, make sure that the replacement fuse is of the same current rating (20 amperes for dc, 5 amperes for ac).

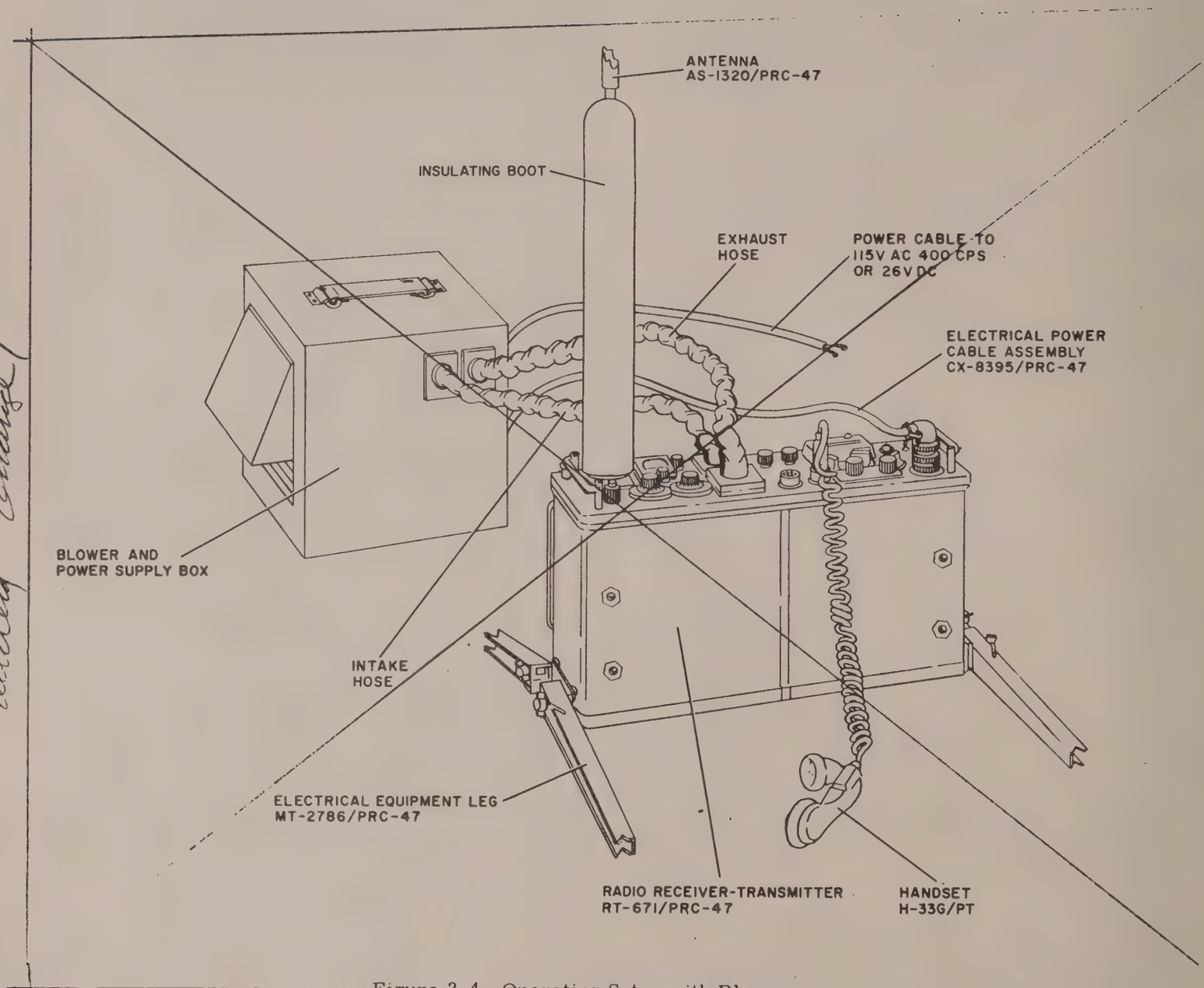
NOTE

Never replace a fuse with one of higher rating unless continued operation of the equipment is more important than probable damage. If a fuse burns out immediately after replacement, do not replace it a second time until the cause of the trouble has been corrected.

c. PANEL LAMPS. - If one of the KILOCYCLES indicator lamps is burned out, unscrew the lamp cap to gain access for removal of the bulb. If one of the lamps near the XMTR OUTPUT meter burns out, first pull out the lens assembly and then the bulb. Spare bulbs are provided in the receiver-transmitter cover.

TABLE 3-2. ROUTINE CHECK CHART

WHAT TO CHECK	HOW TO CHECK
Input Power Voltage	Press BATTERY TEST pushbutton. Meter should read in the white portion. If meter does not read in white area, remove Battery Terminal Adapter MX-4430/PRC-47 and inspect charge indicator. The battery check may also be made with the TUNE-OPERATE switch in TUNE and XMTR PWR switch in HI to test the battery under load.
Panel Lights	Set POWER-LIGHTS switch to the LIGHTS HI and LO positions, and observe that sufficient lighting is provided.
Volume	Rotate VOLUME control clockwise, and observe whether sound increases.
Frequency	Operate frequency controls, and observe that the KILOCYCLES indicator is operating properly.
External Appearance	Check that the control panel and meter faces are clean and legible. Remove dust with a clean, dry, lint-free cloth. Clean the meter faces with lens paper. If necessary, use isopropyl alcohol, conforming to military specification MIL-F-5566, to remove grease and grit.



~~Figure 3-4.~~ Operating Setup with Blower

Change 1

Change 1

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